G. C. E (O/L) Examination - 2020

80 - Information & Communication Technology

Marking Scheme

Distribution of Marks

Paper Structure

Paper I

Consists of 40 compulsory MCQs.

Each Correct answer is given **1 Mark**

Therefore, total allocated marks for **Paper I is 1 mark x 40 = 40 Marks**

Paper II

Consists of Seven Questions

Question No. 1 is compulsory carries **20 Marks**

Other Questions Worth **10 Marks.**

Should answer Any Four Questions from Question No. 02 to 07

Therefore, total allocated marks for **Paper II is 20 + 4 x 10 = 60 Marks**

Distribution of Marks

Paper I	40 MCQs	Compulsory	40 marks
Paper II	Q1	Compulsory	20 marks
	Q2	Any four questions from Q2-Q7	10 marks x 4
	Q3		
	Q4		
	Q5		
	Q6		
	Q7		
Total marks			100 marks

Instructions:

1. Acceptable alternatives for a given word or set of words are separated by slashes (/).
2. Alternative answers are separated by double slashes (//).
3. ✓ indicates to consider as correct if the student's intention is clear.

G.C.E. (O/L) Examination - 2020
Common techniques of marking answer scripts.

It is compulsory to adhere to the following standard method in marking answer scripts and entering marks into the mark sheets.

1. All assistant examiners must use a red colour ball point pen for marking answer scripts.
2. Chief Examiner must use a mauve color pen.
3. Note down Examiner's Code Number and initials on the front page of each answer script. The digits must be written clearly when marks are indicated.
4. Write off any numerals written wrong with a clear single line and authenticate the alterations with Examiner's signature.
5. Write down marks of each subsection of each question in a △ as a rational number and write down the final marks of each question as a rational number in a □ . Use the column assigned for examiners to write down marks.
6. The arithmetic checker (EMF) must use a a blue or black pen to indicate the checking.

Example: **Question No. 03**

(i) .... √ $\frac{4}{5}$

(ii) .... √ $\frac{3}{5}$

(iii) .... √ $\frac{3}{5}$

03 **Total** ➡ $\frac{10}{15}$

MCQ answer scripts:

01. Preparation of Templates
    (i) Mark the correct options on the template according to the Marking Scheme.
    (ii) Cut off the marked windows with a blade.
    (iii) Cut off the cages for Index Number and the number of correct options so as to be able to place the template correctly on the answer script.
    (iv) Cut off a blank space to the right of each options column to mark right or wrong.
    (v) Get the approval for the prepared template from the Chief Examiner.

02. **Then, check the answer scripts carefully. If there are more than one or no answers marked to a certain question write off the options with a line. Sometimes candidates may have erased an option marked previously and selected another option. In such occasions, if the erasure is not clear write off those options too.**

03. Place the template on the answer script correctly. Mark the right answers with a '√' and the wrong answers with a 'X'. Write down the number of correct answers inside the cage given under each column. Then, add those numbers and write the number of correct answers in the relevant cage. Write the converted mark in the relevant cage in the occasions where marks have to be converted.

Structured essay type and essay type answer scripts:

1. Cross off any pages left blank by candidates. Underline wrong or unsuitable answers and mark them as wrong. Show areas where marks can be offered with check marks.

2. Use the right margin of the overland paper to write down the marks.

3. Write down the marks given for each question against the question number in the relevant cage on the front page in two digits. Selection of questions should be in accordance with the instructions given in the question paper. Mark all answers and transfer the marks to the front page. Write off answers with lower marks if extra questions have been answered against instructions.

4. Add the total carefully and write it in the relevant cage on the front page. Turn pages of answer script and add all the marks given for all answers again. Check whether that total tallies with the total marks written on the front page.

Preparation of Mark Sheets.

I. Except for the subjects with a single question paper, final marks of papers will not be calculated within the evaluation board.

II. The Final mark relavant to each paper must be entered to the mark sheets separately.

III. Enter marks of paper I in "Total Marks" column of the mark sheet and write them in words as well.

IV. When the mark sheet of paper II is prepared, the final mark should be written in "Total marks" column after entering detailed marks.

V. For the subject 43 Art, Paper I, paper II and Paper III Marks should be entered numerically in the separate mark sheets and should also be written in words.

VI. For subjects 21 - Sinhala language and literature and 22 - Tamil Language and literature, paper I marks once entered numerically should be written in words. Use separate mark sheets for the papers II and III and enter the total marks in the "Total marks column" after entering the relevant detailed marks.

<u>Note</u>

I. Final marks for paper I, paper II or paper III should always be entered to the mark sheet as a whole number. They should never be kept as decimals or half values.

II. The examiner who entered marks, the examiner who checked marks, the EMF and the chief examiner must certify the accuracy in all page of the mark sheets with their code numbers and signature.

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இலங்கைப் பரீட்சைத் திணைக்களம்
Department of Examinations, Sri Lanka

80 E I, II

අධ්‍යයන පොදු සහතික පත්‍ර (සාමාන්‍ය පෙළ) විභාගය, 2020
கல்விப் பொதுத் தராதரப் பத்திர (சாதாரண தர)ப் பரீட்சை, 2020
General Certificate of Education (Ord. Level) Examination, 2020

තොරතුරු හා සන්නිවේදන තාක්ෂණය I, II
தகவல், தொடர்பாடல் தொழினுட்பவியல் I, II
Information & Communication Technology I, II

පැය තුනයි
மூன்று மணித்தியாலம்
Three hours

අමතර කියවීම් කාලය - මිනිත්තු 10 යි
மேலதிக வாசிப்பு நேரம் - 10 நிமிடங்கள்
Additional Reading Time - 10 minutes

Use additional reading time to go through the question paper, select the questions you will answer and decide which of them you will prioritise.

Information & Communication Technology I

Note :
* *Answer* ***all*** *questions.*
* *In each of the questions* **1** *to* **40**, *pick one of the alternatives (1), (2), (3), (4) which is* ***correct*** *or* ***most appropriate.***
* ***Mark a cross (X) on the number corresponding to your choice in the answer sheet provided.***
* *Further instructions are given on the back of the answer sheet. Follow them carefully.*

1. Which of the following contains only input devices?
(1) Multimedia projector, Printer, Keyboard, Mouse
(2) Printer, Keyboard, Touch screen, Joystick
(3) Monitor, Light pen, Multimedia projector, Keyboard
(4) Mouse, Keyboard, Light pen, Joystick

2. The three main functions of an information system are
(1) input, process and output.
(2) code, compile and execute.
(3) design, develop and test.
(4) select, copy and paste.

3. Which of the following represents the units of measurements of data in computer systems in the **ascending** order of their size?
(1) Bit, Byte, Kilobyte, Terabyte
(2) Byte, Bit, Kilobyte, Terabyte
(3) Megabyte, Kilobyte, Bit, Byte
(4) Terabyte, Gigabyte, Megabyte, Kilobyte

4. Which of the following shows the storage devices of a desktop computer in **descending** order of storage capacity?
(1) Register, Cache memory, Hard disk
(2) Hard disk, RAM, Register
(3) RAM, Register, Cache memory
(4) RAM, Cache memory, Hard disk

5. Which of the following are true about the secondary memory of a computer system?
A - Data is not erased even if the computer is switched off
B - Solid state devices can be used as secondary memory
C - Secondary memory is a part of the CPU memory

(1) A and B only (2) A and C only (3) B and C only (4) All A, B and C

6. Which of the following statements are correct regarding the generations of computers?

A - Transistors were introduced in the first generation computers.
B - High-level programming languages were used in the second and third generation computers.
C - Operating systems with graphical user interfaces (GUI) have been used in fourth generation computers.

(1) A and B only (2) A and C only (3) B and C only (4) All A, B and C

7. Kamalasiri accessed the official web portal of government of Sri Lanka (http://www.gov.lk) to get details about the government web directory. Which of the following service was obtained by Kamalasiri from the Sri Lanka government web portal?

(1) G2B (2) G2C (3) G2E (4) G2G

8. Which of the following contains only the examples of operating systems?

(1) Android, Ubuntu, Windows 10
(2) Ubuntu, Windows 10, Windows Explorer
(3) Android, Windows 10, Windows Explorer
(4) Android, Ubuntu, Windows Explorer

9. Which of the following statement(s) is/are correct?

A - A Graphical User Interface (GUI) provides the facility to use the mouse to execute the commands
B - WIMP stands for Windows, Icons, Menus and Pointer
C - A Command Line Interface (CLI) is more user-friendly compared to Graphical User Interface (GUI)

(1) A only (2) B only (3) A and B only (4) All A, B and C

10. Assume that you are the leader of a team assigned to develop a new information system for your school. Which of the following techniques can be used to identify requirements for this system?

A - Observation
B - Interviews
C - Prototyping

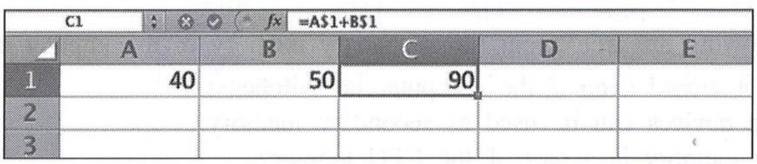
(1) A and B only (2) A and C only (3) B and C only (4) All A, B and C

11. Which of the following is the correct order of activities in the Software Development Life Cycle (SDLC)?

A - Implementation
B - Requirement identification
C - Design
D - Deployment
E - Testing
F - Maintenance

(1) D, B, C, A, E and F (2) B, D, C, A, F and E
(3) B, C, A, E, D and F (4) B, C, D, A, E and F

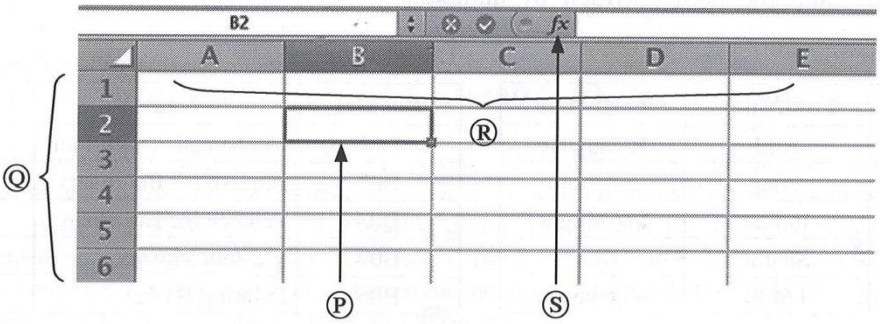
12. In the given spreadsheet segment, cells A1 and B1 display values of 40 and 50 respectively. After entering the formula =A$1+B$1 to the cell C1, it displays the value 90 in C1. If the formula in cell C1 is copied to the cells C2 and D1, what will be the values displayed in cells C2 and D1 respectively?



(1) 90 and 90 (2) 90 and 140 (3) 90 and 50 (4) 50 and 90

[see page three

13. Consider the following spreadsheet segment with four components labelled as Ⓟ, Ⓠ, Ⓡ and Ⓢ.



Which of the following represents the Ⓟ, Ⓠ, Ⓡ and Ⓢ labels in the correct order?
(1) Active cell, Row headings, Insert function, Column headings
(2) Active cell, Row headings, Column headings, Insert function
(3) Insert function, Column headings, Active cell, Row headings
(4) Active cell, Column headings, Row headings, Insert function

14. Which of the following statement(s) is/are correct for a cell range given as C2:E5 in a spreadsheet?

A - Total number of rows in this range is three
B - Geometrical shape of this cell range is a rectangle
C - Total number of cells in this range is 12

(1) A only (2) C only (3) A and B only (4) B and C only

15. Which of the following statements are correct regarding the different types of projectors?

A - Transparent sheets used in overhead projectors always have to be pre-prepared
B - Images can be included in the slides used in a slide projector
C - Electronic presentations made using a computer can be displayed through multimedia projectors

(1) A and B only (2) A and C only (3) B and C only (4) All A, B and C

16. Saman has a collection of properly formatted documents prepared using Microsoft Word and Libre Office Writer. He needs to save those documents without any formatting in order to proof read. What would be the most suitable file extension type for this purpose?

(1) .odt (2) .txt (3) .docx (4) .pdf

17. Which of the following statements are correct regarding the presentation software?

A - The animation effects can be applied only to a single object on a given slide
B - Audio recordings can be included in a presentation slide
C - It is recommended to use less than ten text lines in a single slide

(1) A and B only (2) A and C only (3) B and C only (4) All A, B and C

18. Which of the following are considered as advantages of electronic databases?

A - Smaller physical space is required to store data
B - Easy to obtain copies
C - More efficient in retrieving information

(1) A and B only (2) A and C only (3) B and C only (4) All A, B and C

- Questions **19** to **21** are based on the following database tables that are used to store data about authors, books, and the books written by authors.

Table: Author

AuthorID	FirstName	LastName
1001	Anil	Ratnayake
1002	Vijay	Sekaram
1003	Indika	Serasinghe
1004	Sharaf	Khan
1005	Lalith	Wijenayake

Table: Book

BookID	Name	Price
B01	Mathematics with Fun	500
B02	English for Beginners	400
B03	Science for Everyone	450
B04	Western Music	800
B05	Painting Basics	550

Table: Author_Book

AuthorID	BookID	Royalty_Share
1004	B02	15%
1001	B03	20%
1005	B01	10%
1004	B04	15%
1003	B03	10%

19. What would be the primary key of **Author_Book** table?
(1) AuthorID (2) BookID
(3) AuthorID + BookID (4) AuthorID + Royalty_Share

20. Consider the following statements:
A - AuthorID in the Author table is a foreign key
B - AuthorID in the Author_Book table is a foreign key
C - BookID in the Book table is a primary key

Which of the above statements are correct?
(1) A and B only (2) A and C only (3) B and C only (4) All A, B and C

21. Who is the author of the book titled "Mathematics with Fun"?
(1) Anil Ratnayake (2) Indika Serasinghe
(3) Sharaf Khan (4) Lalith Wijenayake

22. Which of the following statements is **false** about HTML?
(1) HTML stands for Hypertext Markup Language
(2) Web pages can be created using HTML
(3) HTML tags determine how the web pages are displayed in a web browser
(4) HTML documents are created by using a web browser

23. Which of the following HTML tag pair can be used to make a numbered list?
(1) ul, li (2) dl, dd (3) nl, li (4) ol, li

24. Which of the following statements are correct?
A - Search engines are used to find information on the World Wide Web (WWW) when the relevant URL is unknown
B - SMTP is used to transfer messages between mail servers
C - Web server translates domain names into IP addresses

(1) A and B only (2) A and C only (3) B and C only (4) All A, B and C

25. Which of the following statements is **false**?
(1) The Internet is a network of computer networks.
(2) An HTML document which is accessible through the internet is called a web page.
(3) A web page can contain multimedia contents.
(4) The Internet and the WWW are the same.

26. Which of the following HTML tags and parameters can be used to create the given table?

Name	Tel. Number
Premachandra	019-2220001
	075 - 2233441
Sivaraj	018-6722117
	076-4123789

(1) Table, tr, th, and td with rowspan=2
(2) Table, tr, th, and td with colspan=2
(3) Table, th, td, and tr with rowspan=2
(4) Table, td, tr, and th with colspan=2

27. Which of the following is the correct format of an Email address?

(1) nuwan.senevi.gmail.com (2) nuwan2.senevi@gmail.com
(3) nuwansenevi@gmail_com (4) nuwan@senevi@gmail.com

28. Which of the following statements are true?

A - Digital divide separates hardware into two categories, analog and digital
B - Software piracy is copying of computer programs illegally
C - Digital literacy can reduce the digital divide

(1) A and B only (2) A and C only (3) B and C only (4) All A, B and C

29. Which of the following statement(s) is/are correct regarding the Malicious software?

A - Trojan horse is a form of spyware
B - Computer worms can spread by themselves
C - Phishing is a technique of displaying unnecessary messages on the computer screen

(1) A only (2) B only (3) A and B only (4) B and C only

30. In which of the following network topology, each computer is **exactly** connected with two other computers?

(1) Bus (2) Ring (3) Mesh (4) Star

31. What is the resolution of an image which is 250 pixels wide and 100 pixels high?

(1) $250 \div 100$ (2) $250 + 100$ (3) 250×100 (4) $250 \times 100 \times 8$

32. Which of the following statements are correct regarding pixels?

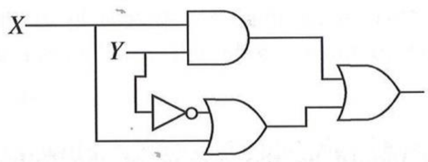
A - Pixels are used to measure the physical dimension of a digital image
B - Number of bits per pixel determine the number of colours in a digital image
C - Pixels of a digital image are arranged in a three-dimensional array

(1) A and B only (2) A and C only (3) B and C only (4) All A, B and C

33. Which of the following represents the given four numbers in **ascending** order?

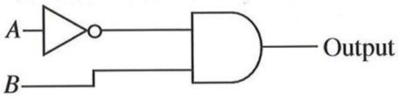
(1) 64_{16}, 226_8, 200_{10}, 101011_2 (2) 101011_2, 64_{16}, 226_8, 200_{10}
(3) 101011_2, 64_{16}, 200_{10}, 226_8 (4) 200_{10}, 226_8, 101011_2, 64_{16}

34. Which of the following Boolean expressions is equivalent to the output of the given logic circuit?

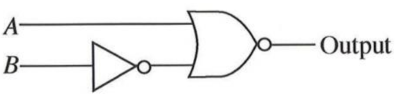


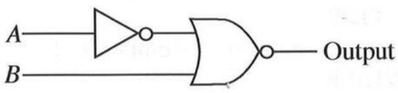
(1) $(x.y)+(\overline{y}+x)$ (2) $(x+y).(\overline{y}.x)$
(3) $(x+y).(x.\overline{y})$ (4) $(x.y)+(y+\overline{x})$

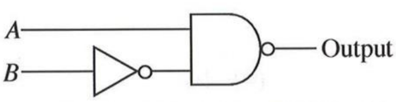
35. Consider the following logic circuit:

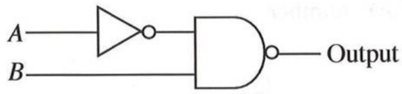


Which of the following logic circuits has a truth table equivalent to the above logic circuit?

(1)


(2)


(3)


(4)


36. Which of the following statements are correct regarding programming languages?

A - Pascal and C are examples of high-level programming languages
B - A program written in machine language can be executed directly on the computer
C - Execution speed of the programs written in assembly language is comparatively higher than the execution speed of the programs written in machine language.

(1) A and B only (2) A and C only (3) B and C only (4) All A, B and C

37. What would be the output of the following Pseudo-code?

```
BEGIN
    sum = 0
    count = 5
    REPEAT
        sum = sum + count*count
        count = count - 1
    UNTIL count > 0
    DISPLAY sum
END
```

(1) 25 (2) 41 (3) 50 (4) 55

38. Consider the following array M in PASCAL language:

M =	10	20	30	40	50	60	70	80

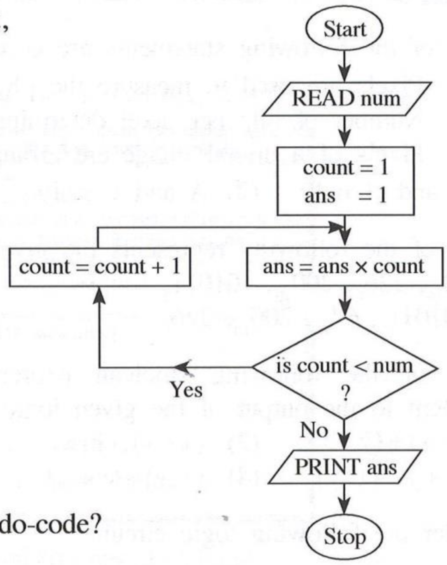
A - array M has a length of 8
B - M[5] has the value 50
C - value of M[1] + M[3] is 60

Which of the above statements are correct?

(1) A and B only (2) A and C only (3) B and C only (4) All A, B and C

39. What would be the output of the given flowchart, if 5 is given as the input for num?

(1) 120
(2) 60
(3) 24
(4) 5



40. What would be the output of the following Pseudo-code?

```
BEGIN
    number = 12
    WHILE number > 5
        IF (number >= 10)
            number = number / 2
        ELSE
            number = number + 4
    ENDWHILE
    DISPLAY number
END
```

(1) 5 (2) 6 (3) 10 (4) 16

ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව
இலங்கைப் பரீட்சைத் திணைக்களம்

රහස්‍යයි
அந்தரங்கமானது

අ.පො.ස. (සා.පෙළ) විභාගය - 2020
க.பொ.த. (சா.தர)ப் பரீட்சை - 2020

විෂය අංකය / பாட இலக்கம் **80** විෂය / பாடம் **Information & Communication Technology**

I පත්‍රය - පිළිතුරු

ප්‍රශ්න අංකය வினா இல.	පිළිතුරෙහි අංකය விடை இல.	ප්‍රශ්න අංකය வினா இல.	පිළිතුරෙහි අංකය விடை இல.	ප්‍රශ්න අංකය வினா இல.	පිළිතුරෙහි අංකය விடை இல.	ප්‍රශ්න අංකය வினா இல.	පිළිතුරෙහි අංකය விடை இல.
01.	04	11.	03	21.	04	31.	03
02.	01	12.	02	22.	04	32.	01
03.	01	13.	02	23.	04	33.	02
04.	02	14.	04	24.	01	34.	01
05.	01	15.	03	25.	04	35.	01
06.	03	16.	02	26.	01	36.	01
07.	02	17.	03	27.	02	37.	01
08.	01	18.	04	28.	03	38.	02
09.	03	19.	03	29.	03	39.	01
10.	04	20.	03	30.	02	40.	01

විශේෂ උපදෙස් / விசேட அறிவுறுத்தல் } එක් පිළිතුරකට ලකුණු / ஒரு சரியான விடைக்கு **01** බැගින් / புள்ளி வீதம்

මුළු ලකුණු / மொத்தப் புள்ளிகள் **01 × 40 = 40**

පහත නිදසුනෙහි දැක්වෙන පරිදි බහුවරණ උත්තරපත්‍රයේ අවසාන තීරුවේ ලකුණු ඇතුළත් කරන්න.
கீழ் குறிப்பிடப்பட்டிருக்கும் உதாரணத்திற்கு அமைய பல்தேர்வு வினாக்களுக்குரிய புள்ளிகளை பல்தேர்வு விடைப்பத்திரத்தின் இறுதியில் பதிக.

නිවැරදි පිළිතුරු සංඛ්‍යාව / சரியான விடைகளின் தொகை: 25 / 40

I පත්‍රයේ මුළු ලකුණු / பத்திரம் I இன் மொத்தப்புள்ளி: 25 / 40

Paper II

1. **(i)---[2]**

> (i) It has been a common practice to use Learning Management Systems (LMS) to manage both schools and higher education institutes. Write down **two** facilities provided by an LMS for students.

Consider only the first two answers. **One mark** per each. **Maximum of two** of them.

- Learn from anywhere
- Upload assignments from home
- Participate in forums
- Participate in activities with video
- Download lecture materials/videos
- View marks/ view notices
- File sharing
- Learn anytime ✓

(ii)---[2]

> (ii) Consider the following two incomplete statements:
>
> (a) The ....Ⓐ.............. is the primary storage device of desktop computers.
>
> (b) An operating system is an example for ....Ⓑ.............. .
>
> Identify the matching term for each of the labels Ⓐand Ⓑ from the list of terms given below. Write down the label and the matching term in the **label** → **term** format.
>
> **List of terms** : {*hard disk, systems software, application software, RAM*}

One **mark** each.

(a) A → RAM ------------- 1 mark

(b) B → systems software ------ 1 mark ✓

(iii)

(iii) (a) Convert the octal number 867_8 to its binary equivalent. Show the major steps of your calculation.
(b) If 1011010_2 represents character 'Z' in ASCII code, what is the ASCII code for character 'X'?

(a)---[1]

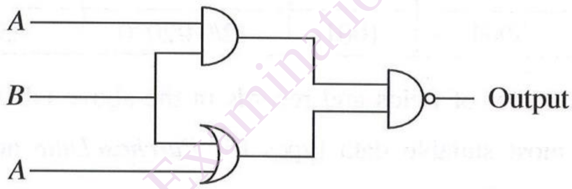
One bonus mark for all students of 3 mediums

(b)---[1]

1011000 **(base 2 is not required)**

(iv) **---[2]**

(iv) Draw the truth table for the logic circuit given below.



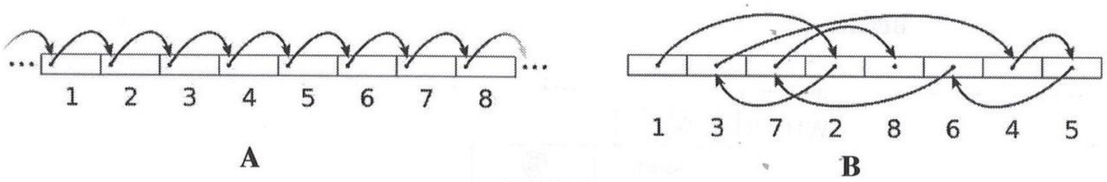
(**.5 marks x 4 = 2 marks)** (.5 per each correct row)

A	B	Output or AB.(B+A)
0	0	1
0	1	1
1	0	1
1	1	0

Column headings A and B are required. Heading of the third column cannot be empty. ✓
No marks if the column headings are empty/not written.

(v)--[2]

(v) (a) Following two diagrams illustrate two types of file accessing methods. Write down the file accessing methods represented by **A** and **B**.



(b) The Operating System identifies file types using file extensions. What is the file extension of a *Powerpoint* file?

(a) A – Sequential access **------ .5 marks**

B – Random access **----- .5 marks**

(b) .ppt or .pptx **(ignore '.', and case)** **------- 1 mark**

(vi) --[2]

(vi) Segment of a word-processed text document is shown below with some formatting done.

❶ and ❷ → **Mahaweli River**
❸
The Mahaweli River is a 335 km long river, ranked as the longest river in Sri Lanka. It has a drainage basin of 10,448 km² which is the largest in the country, which covers almost one-fifth of the total area of the island.

Source : https://en.wikipedia.org/wiki/Mahaweli_River ← ❹

Following are the icons of some formatting tools in a word processing software:

Icon of the formatting tool	B	abc	≡	≡	U	X²	🌐
Icon Label	Ⓟ	Ⓠ	Ⓡ	Ⓢ	Ⓣ	Ⓤ	Ⓥ

Identify the icons of formatting tools, indicated by the labels Ⓟ–Ⓥ which are required to do the formatting tasks indicated by the labels ❶–❹. Write down the label of each formatting task ❶–❹ and its matching icon label of the formatting tool.

(0.5 marks x 4=2 Marks)

Proper answering format (task label → icon label) is required.

1 –P	OR	1 –S
2 –S		2 –P
3- U		3- U
4- V		4- V

(vii) (a)---[1]

(vii) Consider the partly shown *Purchase* database table listing the purchase date and quantities of different items purchased by different suppliers:

Identification number of the Item → ItemID
Date of purchasing → PurchaseDate
Identification number of the Supplier → SupplierID
Number of items purchased → Quantity

SupplierID	ItemID	PurchaseDate	Quantity
S001	1001	02/05/2020	30
S002	1002	05/03/2020	40
S003	1005	25/11/2020	25
S002	1007	05/03/2020	20
S004	1001	12/04/2020	45

(a) Write down the number of fields and records in the above table.

(b) Write down the most suitable data types for *PurchaseDate* and *Quantity*.

(.5 marks x 2 = 1 mark)

Fields – 4 , records – 5

(4, 5 is also accepted)

(b)---[1]

(.5 marks x 2 = 1 mark)

PurchaseDate – DATE/TIME, Quantity – NUMBER//Integer

(viii) ---[2]

(viii) Consider the following Pseudo-code segment with blank spaces labelled Ⓐ to Ⓒ, which calculates and displays the sum of odd numbers between 0 and 10. Write down the suitable expressions for Ⓐ, Ⓑ, and Ⓒ in the **label** → **expression** format.

```
BEGIN
    sum = 0
    num = 1
    WHILE [ Ⓐ ]
        sum = [ Ⓑ ]
        num = [ Ⓒ ]
    ENDWHILE
    DISPLAY sum
END
```

A correct ----- 1 mark

B correct ----- .5 marks

C correct ----- .5 marks

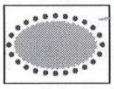
A → num <= 9 // num < 10 // num <=10

B → sum + num // num + sum

C → num + 2 // 2 + num ✓

(ix) --[2]

(ix) The following table shows some of the formatting tools of the GIMP software.

Icon of the formatting tool				
Icon Number	❶	❷	❸	❹

Identify the suitable description for each of the icons ❶–❹ from the **description list** labelled Ⓐ–Ⓓ given below.

Write down each icon number in the above table and its matching description label in the **icon number → description label** format.

Description List : {Ⓐ – Draws free form selections,
Ⓑ – Selects the required area as a circular or elliptical region,
Ⓒ – Create paths to select shapes,
Ⓓ – Paints hard-edged lines}

(.5 marks x 4 = 2 marks)

(**proper format or mapping** is required)

1 – B
2 – D
3 – C
4 – A

(x) a) --[1]

(x) (a) List **two** advantages of having a Local Area Network (LAN) for a department.
(b) Write the names of **two** types of computer networks according to the geographical distribution.

Consider only the first two answers. **(.5 marks x 2 = 1 mark)**

- Resources such as printers can be shared by all the computers connected to the network
- Storing of files in a centralized location
- Local messaging is possible
- Data can be shared/transferred easily
- Access privileges ✓

b) --[1]

Consider only the first two answers. **(.5 marks x 2 = 1 mark)**

Local Area Network (LAN)
` Wide Area Network (WAN)
Metropolitan Area Network (MAN)

2. (i)---[2]

(i) For each of the malpractices (labelled Ⓐ–Ⓓ) below, identify the relevant term from the **list of terms** and write down the term against each relevant label in the **label** ⟶ **term** format.

Label	Malpractices
Ⓐ	Steal important data and information stored on computers without the knowledge of the owner
Ⓑ	Copying and pasting a paragraph to a document from the internet without citing
Ⓒ	An employee using someone else's identity to gain a financial advantage
Ⓓ	Using someone else's innovation for other developments without his/her knowledge

List of terms : {identity theft, intellectual property rights violation, plagiarism, data theft, piracy, spam}

(.5 marks x 4 = 2 marks)

A – Data Theft

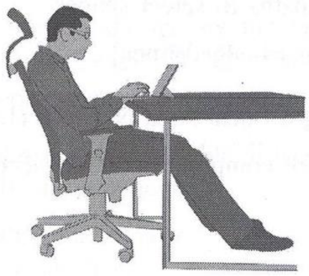
B - Plagiarism

C - Identity theft

D - intellectual property rights violation

(ii)---[4]

(ii) Write down **four** health-related issues that may occur due to the posture of the person shown in the following diagram.



Consider only the first four answers. **(1 mark x 4 = 4 marks)**

Musculoskeletal Problems

RSI – Repetitive Stress Injury

CTS – Carpel Tunnel Syndrome ✓

Headache

CVS - Computer Vision Syndrome

(iii) --[2]

(iii) Consider the following statements with blank spaces labelled as Ⓐ, Ⓑ, Ⓒ, Ⓓ, and Ⓔ. Identify the most suitable term to fill each blank from the **list of terms** given below. Write down the relevant term against each label in the **label → term** format.

(a) ....Ⓐ.............. is used to secure data stored in a stand alone computer by blocking unauthorized entry.

(b) ....Ⓑ.............. is essential to safeguard important data in an event of a failure of a computer.

(c) ....Ⓒ.............. is an act of cheating users to collect user names and passwords of electronic bank accounts.

(d) ....Ⓓ.............. can be used to safeguard a computer system from harmful software.

(e) ....Ⓔ.............. enters a computer as an executable file and can erase files.

List of terms : {backup, virus guard, firewall, phishing, password, virus, spamming}

1 correct ---- .5 marks
2 correct --- 1 mark
3 correct --- 1.5 marks
4/5 correct --- 2 marks

A - password

B - backup

C - phishing

D - virus guard // firewall

E - virus

(iv)--[2]

(iv) The following table lists four labels and descriptions related to computer networking.

Label	Description
Ⓐ	Operates as a secured barrier between the Internet and a given network
Ⓑ	Example for a guided transmission media
Ⓒ	Connects two different networks
Ⓓ	Mode of communication used in telephone conversation

Match the most suitable term from the **list of terms** given below and write down the relevant term against each label in the **label → term** format.

List of terms : {Twisted pair, Full duplex, Half duplex, Gateway, Firewall, Wi-Fi, DNS Server}

(.5 marks x 4 = 2 marks)

A - firewall
B – twisted pair
C - gateway
D – full duplex

3. Following are the partly shown relational database tables that are used to store information about supervisors, projects, and the projects supervised by supervisors in a University.

Table: Supervisor

SupervisorID	FirstName	LastName	DepartmentName
S01	Anil	Priyantha	Computer Science
S02	Mohamed	Nazwar	Chemistry
S03	Raj	Selvam	Physics
S04	Anura	Wijenayake	Computer Science
S05	Keerthi	Nanayakkara	Mathematics
:			

Table: Project

ProjectID	StartDate
P001	05/03/2019
P002	05/03/2019
P003	05/03/2019
P004	05/03/2018
P005	10/04/2020
:	

Table: Supervisor_Project

SupervisorID	ProjectID	Allowance
S01	P003	20,000
S02	P002	10,000
S02	P001	15,000
S04	P001	10,000
S03	P004	12,000
:		

(i)

(i) State whether the following statements are TRUE or FALSE.
(a) **SupervisorID** is a foreign key of **Supervisor_Project** table.
(b) **ProjectID** is the primary key of **Supervisor_Project** table.

(a)---**[1]**

TRUE (ignore case)

(b)---**[1]**

FALSE (ignore case)

(ii)

(ii) Which table(s) need(s) to be updated to accommodate the following changes?

(a) *Anura Wijenayake* is assigned as a Supervisor for the project P002 with an allowance of 10,000.

(b) A new supervisor, *Pradeep Dissanayake* (**SupervisorID**: S06) joined the Department of *Chemistry* and was assigned as a supervisor for an ongoing project (**ProjectID**: P003) with an allowance of 15,000.

(a)--**[2]**

Supervisor_Project
(**Zero marks** if more than one table name is given, Exact spelling is required including '_' sign, ignore case defects)

(b)--**[2]**

Supervisor, Supervisor_Project
(**2 or 0 marks;** 2 marks if both table names are correct, otherwise 0 marks. 0 marks if more than two table names are given. Exact spelling is required including _ sign, ignore case defects)

(iii) --**[2]**

(iii) On 15/09/2020, the University started a new project (**ProjectID**: P006) with *Mohamed Nazwar* and *Raj Selvam* as supervisors. An amount of 11,000 is allocated for each supervisor. Write down the new record(s) to be added to the relevant table(s) for the above change. Use the format *tablename* → (*field1*, *field2*, ..) for each record.

(Ignore case and space defects)

Project → (P006, 15/09/2020) ------- 1 mark

Supervisor_Project → (S02, P006, 11,000), (S03, P006, 11,000) ----- .5 x 2 = 1 mark

(iv)--**[2]**

(iv) What are the most appropriate tables to be joined to write a query to find the Department name(s) of the supervisor(s) who supervise(s) the project P001?

Supervisor, Supervisor_Project
(**2 or 0 marks;** 2 marks if both table names are correct, otherwise 0 marks. 0 marks if more than two table names are given. Exact spelling is required including _ sign, ignore case defects)

4. (i)--[2]

(i) Write down **two** advantages of using SaaS (Software as a Service), which is a cloud computing service, for an institute.

One mark each. Maximum of two marks.

- Reduce Software cost
- Easy software Maintenance
- Receive instant updates

✓

(ii)--[2]

(ii) Match the descriptions labelled Ⓟ–Ⓢ with the correct terms from the list of terms given below and write down the relevant term against each label in the **label** ⟶ **term** format.

Label	Description
Ⓟ	Identifies a computer uniquely on the Internet
Ⓠ	Connects a web page to another web page
Ⓡ	Converts a domain name into an IP address
Ⓢ	Used for the communication between a web server and a web browser

List of terms : {FTP, IP address, Pagelink, SMTP, DNS, URL, HTTP, Hyperlink}

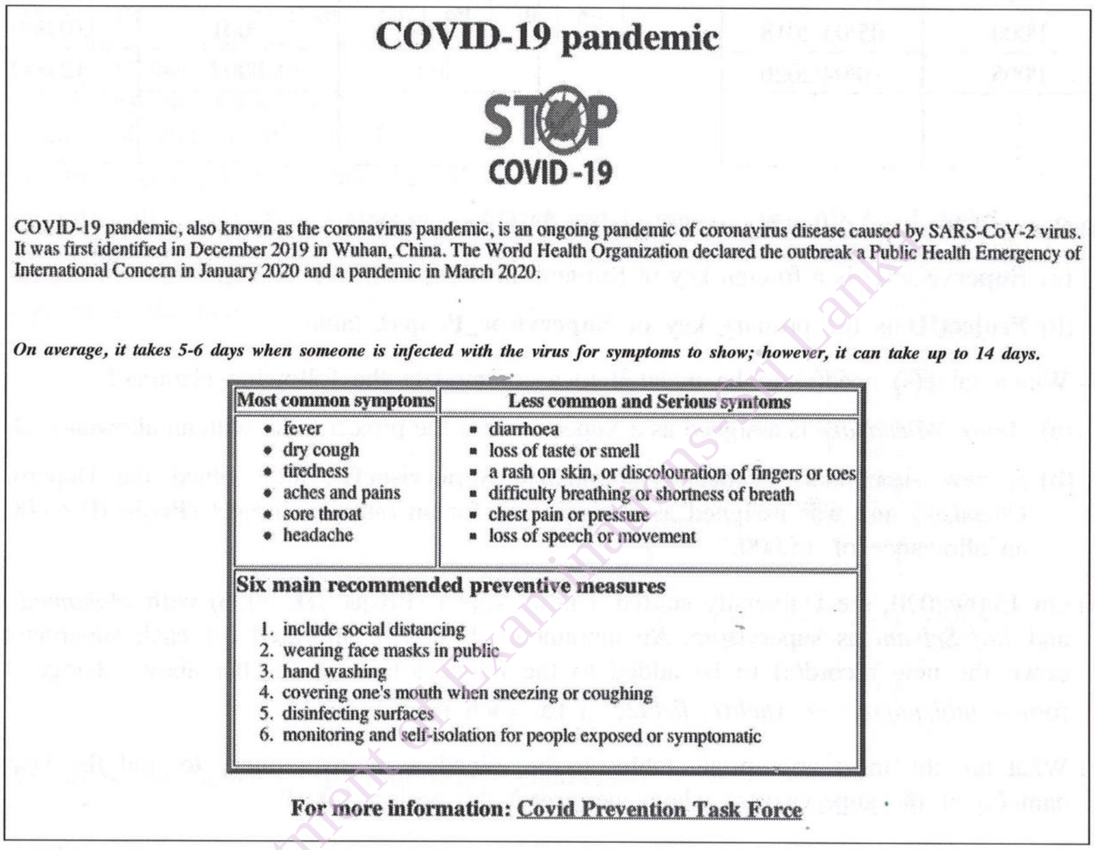
(.5 marks x 4 = 2 marks)

P - IP address, Q – Hyperlink, R - DNS, S - HTTP

(iii)---[6]

(iii) The HTML source of the web page shown in **Figure 1** is given in **Figure 2** with certain missing tags labelled ❶ to ❿. You are required to write down the label number and the corresponding HTML tag selecting from the list given below.

List : {*h6, h1, alt, title, br, tr, i, td, p, type, rowspan, colspan, th, a, u*}



COVID-19 pandemic

STOP COVID-19

COVID-19 pandemic, also known as the coronavirus pandemic, is an ongoing pandemic of coronavirus disease caused by SARS-CoV-2 virus. It was first identified in December 2019 in Wuhan, China. The World Health Organization declared the outbreak a Public Health Emergency of International Concern in January 2020 and a pandemic in March 2020.

On average, it takes 5-6 days when someone is infected with the virus for symptoms to show; however, it can take up to 14 days.

Most common symptoms	Less common and Serious symtoms
• fever • dry cough • tiredness • aches and pains • sore throat • headache	▪ diarrhoea ▪ loss of taste or smell ▪ a rash on skin, or discolouration of fingers or toes ▪ difficulty breathing or shortness of breath ▪ chest pain or pressure ▪ loss of speech or movement
Six main recommended preventive measures 1. include social distancing 2. wearing face masks in public 3. hand washing 4. covering one's mouth when sneezing or coughing 5. disinfecting surfaces 6. monitoring and self-isolation for people exposed or symptomatic	

For more information: <u>**Covid Prevention Task Force**</u>

Figure 1: Web page

```
html>
<head>  <❶>  COVID-19 pandemic</❶> </head>
<body>
<❷><center>COVID-19 pandemic</center></❷>
<center>< img src="covid19.png" width="130" height="100"  ❸="Mosquito Photo"></center>

<p>COVID-19 pandemic, also known as the coronavirus pandemic, is an ongoing pandemic of
    coronavirus disease caused by SARS-CoV-2 virus. It was first identified in December 2019 in
    Wuhan, China. The World Health Organization declared the outbreak a Public Health Emergency
    of International Concern in January 2020 and a pandemic in March 2020. </p> <❹/>
<p ><❺>On average it takes 5–6 days when someone is infected with the virus for symptoms to
    show, however it can take up to 14 days.</❺></p>

<table border="4" align = "center">
<tr><th>Most common symptoms</th><th> Less common and Serious symtoms</th></tr>
<❻><❼>
   <ul>
     <li> fever</li>
     <li> dry cough</li>
     <li> tiredness</li>
     <li> aches and pains</li>
     <li> sore throat</li>
       <li>headache </li>
   </ul>
</❼>
<❼>
   <ul ❽="Square">
        <li> diarrhoea</li>
        <li> loss of taste or smell</li>
        <li> a rash on skin, or discolouration of fingers or toes</li>
        <li> difficulty breathing or shortness of breath</li>
        <li> chest pain or pressure</li>
        <li> loss of speech or movement</li>
   </ul>
</❼></❻>
<❻> <td  ❾="2">
 <h2>Six main  recommended preventive measures</h2>
<ol>
   <li> include social distancing</li>
   <li> wearing face masks in public</li>
   <li> hand washing</li>
   <li> covering one's mouth when sneezing or coughing</li>
   <li> disinfecting surfaces</li>
   <li> monitoring and self-isolation for people exposed or symptomatic</li>
</ol>
 </❼></❻>
</table>
<center><h3>For more information: <❿ href="https://www.health.lk"> Covid Prevention Task Force
    </❿> </h3></center>
<body>
</html>
```

Figure 2: HTML Source

Exact spelling important.

One mark each for 6 and 7
.5 marks for others
for 3, 8, 9 give marks if the intention of the student is clear regarding the difference between tags and parameters/attributes

1	- title // <title>	...................0.5
2	- h1 // <h1>	...................0.5
3	- alt	..................0.5
4	- br // 	...................0.5
5	- i // <i>	...................0.5
6	- tr // <tr>	**.................... 1**
7	- td // <td>	**.................... 1**
8	- type	....................0.5
9	- colspan	....................0.5
10	- a // <a>	.... 0.5

5.

The following spreadsheet segment shows some statistics of test cricket players with most Centuries scored.

	A	B	C	D	E	F	G	H	I	J	K
1	**Most Centuries (100s) Scored by Cricket Players**										
2	Player	Span	Matches	Innings	Not Outs	Runs	Highest score	Average	Centuries (100s)	Fifties (50s)	Ducks (zeros)
3	SR Tendulkar	1989-2013	200	329	33	15921	248*		51	68	14
4	JH Kallis	1995-2013	166	280	40	13289	224		45	58	16
5	RT Ponting	1995-2012	168	287	29	13378	257		41	62	17
6	KC Sangakkara	2000-2015	134	233	17	12400	319		38	52	11
7	R Dravid	1996-2012	164	286	32	13288	270		36	63	8
8	Younis Khan	2000-2017	118	213	19	10099	313		34	33	19
9	SM Gavaskar	1971-1987	125	214	16	10122	236*		34	45	12
10	BC Lara	1990-2006	131	232	6	11953	400*		34	48	17
11	DPMD Jayawardene	1997-2014	149	252	15	11814	374		34	50	15
12	AN Cook	2006-2018	161	291	16	12472	294		33	57	9
13	SR Waugh	1985-2004	168	260	46	10927	200		32	50	22
14	ML Hayden	1994-2009	103	184	14	8625	380		30	29	14
15	S Chanderpaul	1994-2015	164	280	49	11867	203*		30	66	15
16	DG Bradman	1928-1948	52	80	10	6996	334		29	13	7
17	MJ Clarke	2004-2015	115	198	22	8643	329*		28	27	9
18	HM Amla	2004-2019	124	215	16	9282	311*		28	41	13
19	SPD Smith	2010-2021	77	139	17	7540	239		27	31	5
20	V Kohli	2011-2021	87	147	10	7318	254*		27	23	10
21	GC Smith	2002-2014	117	205	13	9265	277		27	38	11
22	AR Border	1978-1994	156	265	44	11174	205		27	63	11
23	*Source: https://stats.espncricinfo.com/ci/content/records/227046.html*										
24						Highest Average					

(i) -- [2]

(i) The column H is used to show the Batting Average of each player. The average of a player is calculated by using the formula =*(Runs)/(Innings - Not Outs)*
Write down the formula that should be entered into cell H3 to obtain *SR Tendulkar*'s average.

= F3/(D3-E3)

or

\+ F3/(D3-E3)

Note: parentheses needed, naming cell addresses are not case sensitive

(ii) ---[2]

(ii) Assume that the formula entered to cell H3 is copied to the cell range H4:H22. Write down the formula displayed in the cell H22.

= F22/(D22-E22)

Or

\+ F22/(D22-E22)

Note: parentheses needed, naming cell addresses are not case sensitive

(iii) ---[2]

(iii) Write down the steps to display these averages in column H with two decimal places.

<u>Method 1</u>
Place the cursor on the column H. Press (click left mouse) on the **<u>icon "decrease decimal" in MS Excel(</u>**  **<u>) several times</u>** until **<u>you see two decimal places</u>** on the spreadsheet.

Can be used equivalent icon "delete decimal places" in Libre Office Calc ( *)*
N.B Required underlined phrases to get 2 marks

Method 2

Sequence of steps	**MS Execl 2010 ver14.0**	**Libre Calc Version: 7.0.3.1 (x64)**
1	Place the cell pointer and click on a cell in column H	Place the cell pointer and click on a cell in column H
2	Click right button of the mouse	Click right button of the mouse
3	Select "Format cells" from menu	Select "Format cells" from menu
4	Select "Number" Tab from the window	Select "Number" Tab from the window
5	Select " Number" from category	Select " Number" from category
6	Set decimal places to 2	Set decimal places to 2 under options
7	Press OK	Press OK

If 7 steps are written [in correct order]
Give 2 marks if all required steps are written [in correct order]

Do not give marks for **any other** complicated, long formulas.

(iv)---[2]

(iv) Write down the formula in the form of *=function(cell1:cell2)* that should be entered in cell H24 to find the highest average.

= MAX(H3:H22)

OR

\+ MAX(H3:H22)

(v)

(v) Write down the **most suitable chart type** available in spreadsheet software from the given **List of Charts** for the following:

(a) To show the number of Centuries, Fifties and Ducks obtained by *SR Tendulkar*.

List of Charts for part (a): {Pie, Line, Scatter, Area}

(b) To show the comparisons of the Centuries, Fifties and Ducks obtained by all players in the same chart.

List of Charts for part (b): {Area, Pie, Bar, Scatter}

(a) ---[1]

Pie chart

(b) ---[1]

Bar chart

6.

(i) Consider the following scenario related to the development of a Hotel Management System.

Malani, the Deputy General Manager/IT of *StayHere Hotel* proposed to introduce a new computerized system to the hotel. This is mainly due to the limitations of the existing hotel management system to meet the quality requirements such as performance and security. Malani assigned two programmers, **Nimal** and **Anwer**, to develop the "Room reservation" and "Inventory management" components respectively. After completing these two components, they were merged. **Krishna**, a member of the testing team, was assigned to test the merged version of the system. Afterward, several new components were added to the system. Once the new system is completed, **Pradeepa**, head of the testing team, arranged a testing session with the end-users (Hotel staff) of the Hotel Management System. During this session, most of the end-users requested training sessions to be familiar with the functionalities of the new system. Therefore, it was decided that it is better to run both systems together and terminate the old system only after all end-users are properly trained.

(a) Which type of testing was carried out by Krishna?

(b) Which type of testing was carried out by the hotel staff?

(c) Who carried out Unit Testing of the new Hotel Management System?

(d) The development team used the *Iterative-Incremental* model to develop the new system. State **one** reason to justify this decision.

(e) What type of system deployment approach is used for the above Hotel Management System?

(i) (a) -- [1]

Integration testing

(b)--[1]

Acceptance testing

(c)--[1]

Nimal and Anwar

(1 or 0 marks, both names are required, 0 marks if more than two names are given)

(d)--[2]

It is mentioned that the project is developed as a collection of multiple components. Therefore, it is clear that the project is done in several increments (any answer which gives this idea should be given full marks)

(e)--[1]

Parallel deployment

(ii)--[4]

(ii) Nimal logged into an online banking system to transfer money to his son. Nimal entered the account number of his son and the amount to be transferred. The system requested a PIN (Personal Identification Number) to approve the transaction. After verifying the PIN number, the system displayed all the transfer details and obtained the final approval (OK) from Nimal. After successful completion of the transaction, Nimal received an e-receipt.

Write down **two** inputs, **two** processes and **two** outputs of the above scenario.

Consider only the first two if more than two inputs/outputs/processes are given.

- inputs : account number, amount, PIN, Final approval (OK)

  (.5 marks x 2 = 1 mark)

- output: pin request message, display all transfer details form, e-receipt

  (.5 marks x 2 = 1 mark)

- Process: verify pin, process details, generate receipt, (verify amount could also conserved as a correct answer)

  (1 mark x 2 = 2 marks)

7. (i) --[2]

(i) Write **one** similarity and **one** difference between *Variables* and *Constants* in a computer program.

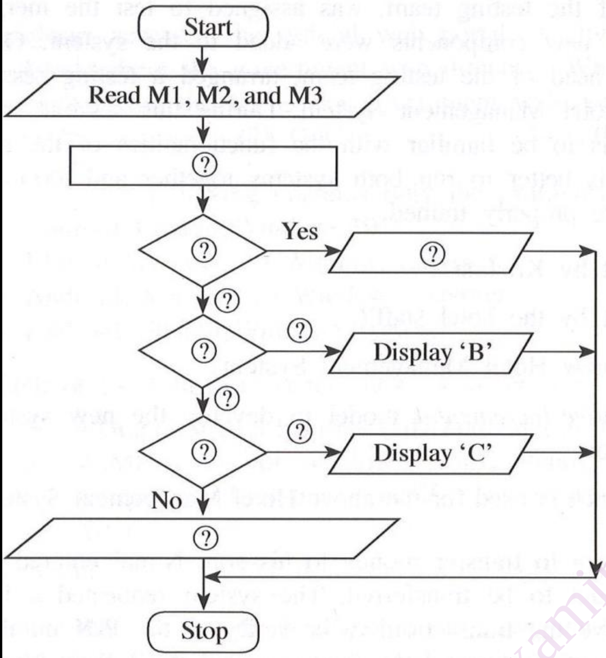
Similarity: both are used to store values in a computer program / both occupy memory space, both are having names, both are having data types

Difference: values of the variables can be changed during the program execution

✓

(ii) --**[6]**

(ii) The following flow chart is drawn to calculate average marks (avg) and display the grades when marks (M1, M2, M3) of three subjects are given as inputs. The grades are decided according to the following table.



Table

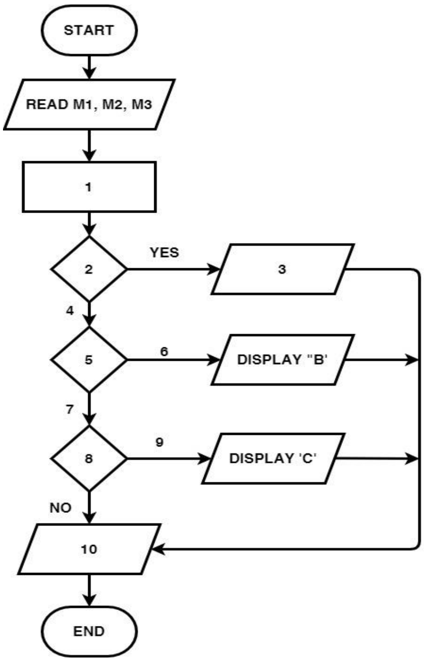
Average marks (avg)	Grade
Greater than or equal to 80	A
Less than 80 and greater than or equal to 65	B
Less than 65 and greater than or equal to 50	C
Otherwise	No Grade

Copy the above flowchart to your answer script and fill the blanks indicated by ? according to the given scenario.

(.5 marks x 10 = 5 marks)

1 bonus mark for the completeness of diagram and answers.

1	avg = (M1+M2+M3)/3		✓
2	Is **avg >= 80**?		✓
3	DISPLAY 'A'		
4	NO		
5	Is **avg >= 65**?	Is (avg >= 65) and (avg < 80)?	✓
6	YES		
7	NO		
8	Is **avg >= 50**?	Is (avg >= 50) and (avg < 65)?	✓
9	YES		
10	DISPLAY 'No Grade'		



(iii) --**[2]**

(iii) Consider the following array **A** which contains zeros in all locations.

A[0]	A[1]	A[2]	A[3]	A[4]
0	0	0	0	0

What would be the values of Ⓟ, Ⓠ, Ⓡ, Ⓢ and Ⓣ, after executing the following Pseudo-code on array A.

```
BEGIN
   value = 2
   k = 0
   REPEAT
          A[k] = value
          value = value * 5
          k = k + 1
   UNTIL k < 5
END
```

A[0]	A[1]	A[2]	A[3]	A[4]
Ⓟ	Ⓠ	Ⓡ	Ⓢ	Ⓣ

If P correct – 1 mark

If all Q, R, S, T correct – 1 mark

A[0]	A[1]	A[2]	A[3]	A[4]
2	0	0	0	0

Or

P = 2, Q = 0, R = 0, S = 0, T = 0

- End of the Marking Scheme -